

CHAPTER

5

Residential Meter Installation

This chapter contains information on the metering equipment required for connection of a new residential electric service. Call our Technical Services department at (360) 992-8854 regarding questions about residential electric service metering.

Service rating options

Clark Public Utilities' metering equipment standards for single-family, residential structures (this does not include apartments or condominiums) are based upon the single-phase service ratings listed in the chart at the right.

If a three-phase electric service is being considered, contact Clark Public Utilities' Construction Services department at (360) 992-8558, or visit our website www.clarkpublicutilities.com to view our *Commercial Electric Service Handbook*. Such services require the approval of Clark Public Utilities' Engineering department, and are not covered in this handbook.

Voltage	Ampere Rating
120/240	less than 200 amps
120/240	200 amps
120/240	400 amps
120/240	over 400 amps

Responsibilities***Clark Public Utilities is responsible for:***

- ▶ Installing the meter, **current transformers (CT)**, if required, and associated CT wiring.
- ▶ Unlocking, removing and installing meters.

NOTE: Only authorized and qualified Clark Public Utilities personnel shall unlock, remove and install meters.

Customer is responsible for:

- ▶ Providing and installing all service entrance equipment including the meter base and CT enclosure.
- ▶ Maintaining required meter equipment safety clearances at all times.
- ▶ Providing 24-hour access to meters and associated equipment.

Meter bases

General requirements

The residential meter base that is installed shall meet the following general requirements:

- ▶ Rated for exterior use and rain tight.
- ▶ ***Underwriters Laboratories (UL)*** rated.
- ▶ Have unused openings in the enclosure tightly sealed from the inside of the base.
- ▶ Installed level, plumb, and fastened securely to a rigid structure.

NOTE: Specific metering requirements for 200 and 400 amp services and services to outbuildings are listed later in this chapter.

Meter base location

Clark Public Utilities currently requires all meter bases and ***associated equipment*** (CT enclosures, etc.) be attached to the outside of a permanent, fixed structure.

Single-family residences and manufactured homes require meter bases installed in a location that is accessible to Clark Public Utilities. All locations are subject to approval by a Clark Public Utilities representative. Questions regarding meter locations can be addressed by calling our Construction Services department at (360) 992-8558.

Meter bases and CT enclosures are to be located:

- ▶ Outside.
- ▶ On the ground floor, with the center of the meter 5 to 6 feet above finished grade (5 feet preferred).
- ▶ On the front one-third of the home closest to normal public access.
- ▶ In an area that is not subject to being fenced-in (patios, decks, breezeways, and backyards are not approved locations).
- ▶ If the meter is not located on the building it serves, it may be installed on another structure that is owned by the customer and accessible by Clark Public Utilities personnel. This type of installation requires prior approval from a utility representative.

These locations allow Clark Public Utilities to:

- ▶ Read the meter in a cost-effective manner.
- ▶ Maintain the meter efficiently.
- ▶ Disconnect the electric service in case of emergency.

Do not locate meter bases:

- ▶ Where shrubs or landscaping could obstruct access.

- ▶ On mobile structures such as a houseboat or manufactured home.
- ▶ Above a stairway or window well.
- ▶ Outside of bedroom or bathroom windows and doors, to respect customer privacy.

Utility personnel require access to this equipment to perform maintenance. These requirements also apply to meter base installations on outbuildings, garages, pump houses and other structures that do not provide living spaces.

Grounding requirements

All meter bases, enclosures and conduit shall be bonded and grounded in accordance with the NEC and the local governing office.

Clearance requirements for residential meter installations

The following clearances are required around all meter installations.

- ▶ The center of the meter is located between 5 to 6 feet above finished grade (5 feet preferred). For factory-built manufactured home meter pedestals, locate the center of the meter at 3 feet.
- ▶ A clear working space, 3 feet deep, in front of the meter (*Figure 19*). This space is to be kept clear of any obstructions including landscaping, decks, air conditioning units, etc.

Figure 19 Meter base minimum work clearances

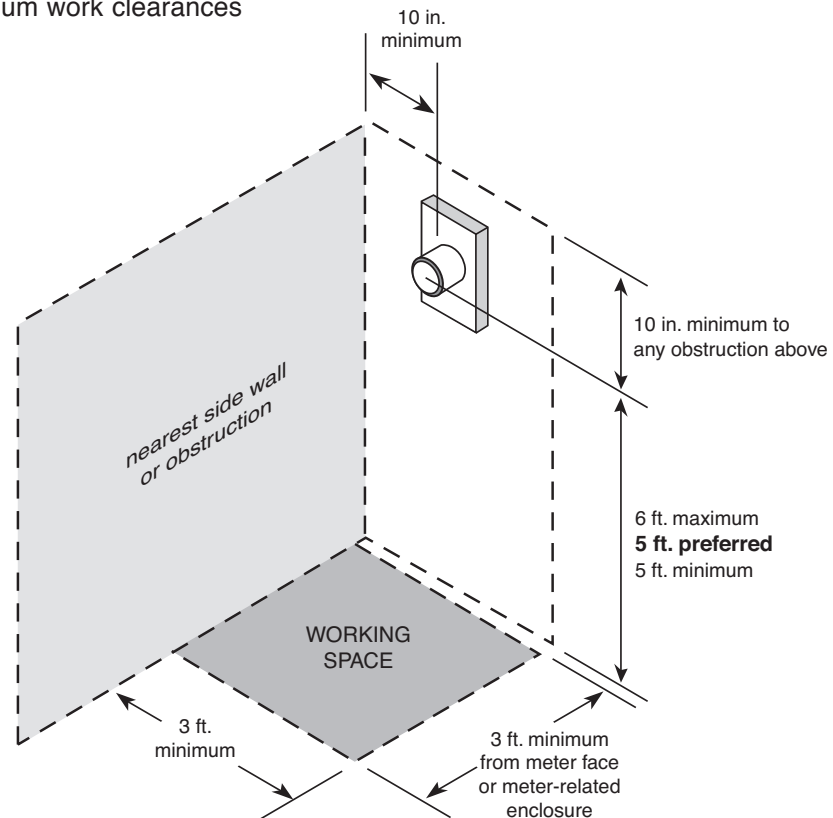
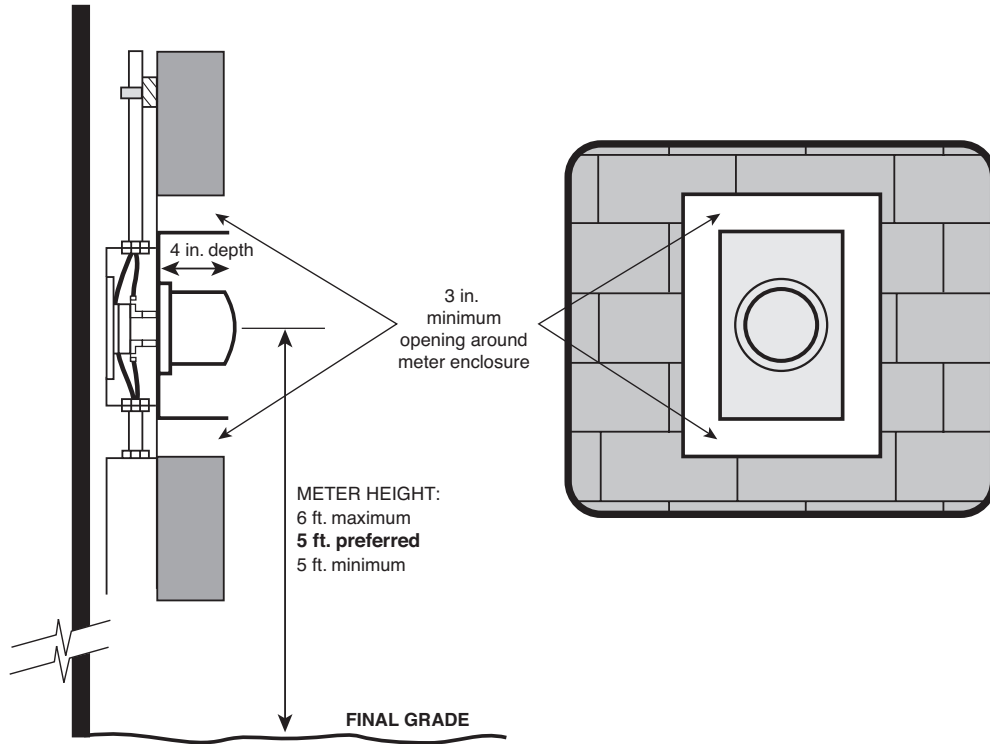


Figure 20 Recessed meter base detail

- ▶ A 3-foot horizontal clearance from all parts of a natural gas meter.
- ▶ There is a 10-inch minimum horizontal and vertical clearance between the center of the electric meter and any obstruction (*Figure 19*).
- ▶ If a recessed meter base is installed, a 10-inch radial clearance is required from the center of the meter to the closest portion of the wall.
- ▶ If a flush or recessed meter base is installed, the siding or finished surface of the structure shall not overlap the cover of the meter base.
- ▶ The opening around a recessed meter base must extend a minimum of 3 inches (*Figure 20*).
- ▶ Enclosing residential electric meter bases is not acceptable.

200 amp services

Single-family residence

The 120/240 volt, 200 amp service is the most common residential service installed by Clark Public Utilities (*Figure 21*). Typically, this size of service is installed to homes with a living area of less than 3,000 square-feet. Depending upon the type of appliances, heating and cooling systems or other equipment (hot tub, jetted tub, etc.) being installed, a larger service may be necessary. It is the customer's responsibility to determine and notify Clark Public Utilities of the electrical requirements based on connected load. Refer to Clark Public Utilities' *New or Altered Electric Service Worksheet* on page 55 for information requested to start a job.

In addition to the meter base requirements mentioned earlier in this chapter, meter bases for 200 amp underground services shall:

- ▶ Be rated for 120/240 volts and 200 amps.
- ▶ Contain four **meter jaws** and a connection point for the **neutral** conductor.
- ▶ Accept 2-inch, PVC, conduit.
- ▶ Have lugs (electrical connectors) that are marked to accept 4/0 aluminum conductors.

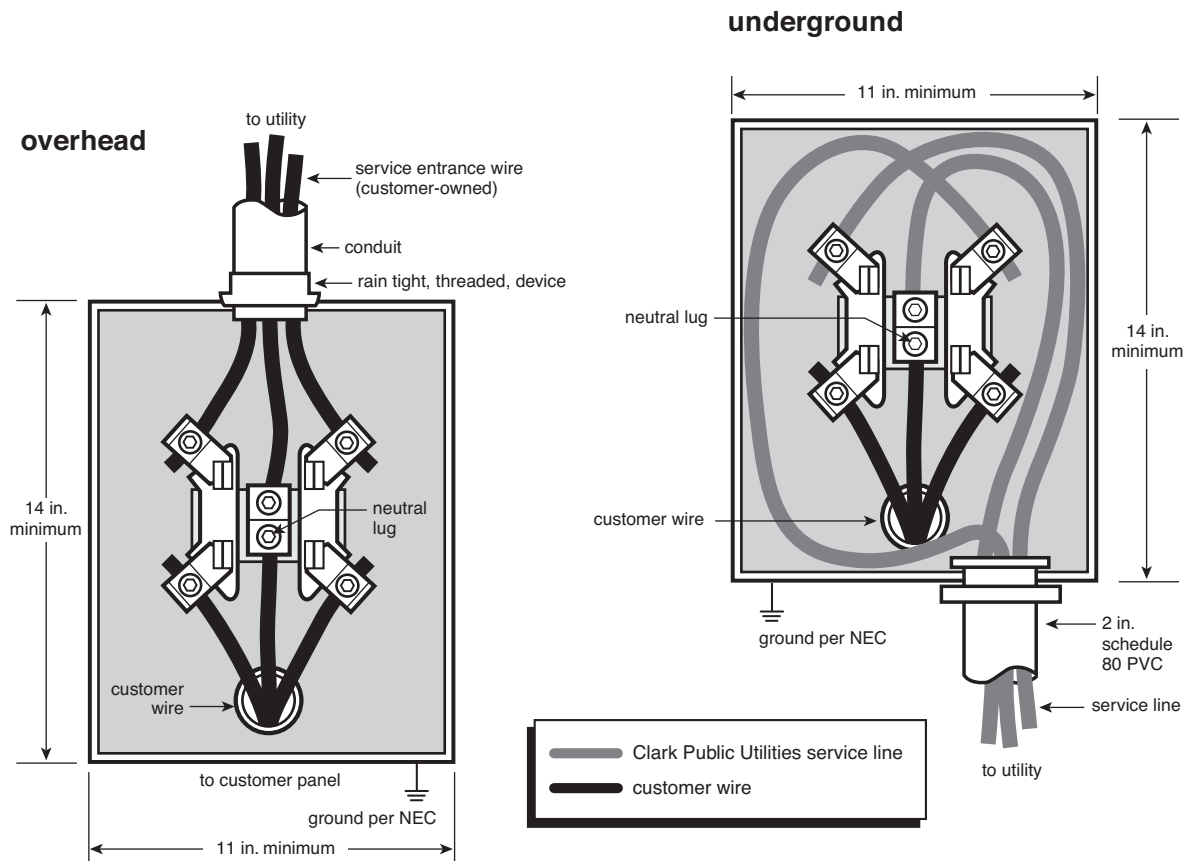
NOTE: Do not route service conductor through the center knockout located on the bottom of the meter base.

Outbuildings

Meter bases for 200 amp (or less) services to residential use outbuildings (such as garages, shops, single-family wells or non-commercial barns) shall meet all the requirements listed in this chapter, the NEC and at the local inspecting office.

If an outbuilding will be used for commercial or multifamily purposes (such as a professional shop, dairy barn, illuminated sign, community security gate, or multifamily/community well) there will be additional requirements. Visit our website www.clarkpublicutilities.com to view our **Commercial Electric Service Handbook** or contact Clark Public Utilities' Construction Services department at (360) 992-8558 for additional information.

Figure 21 Typical 200 amp residential meter bases



400 amp services

The meter base required for a 120/240 volt, 400 amp service is called a class 320 meter base (*Figure 22*). It is larger than the 200 amp meter base but it is still a self-contained metering system. It can be installed on residences where the continuous current rating is 320 amps or less.

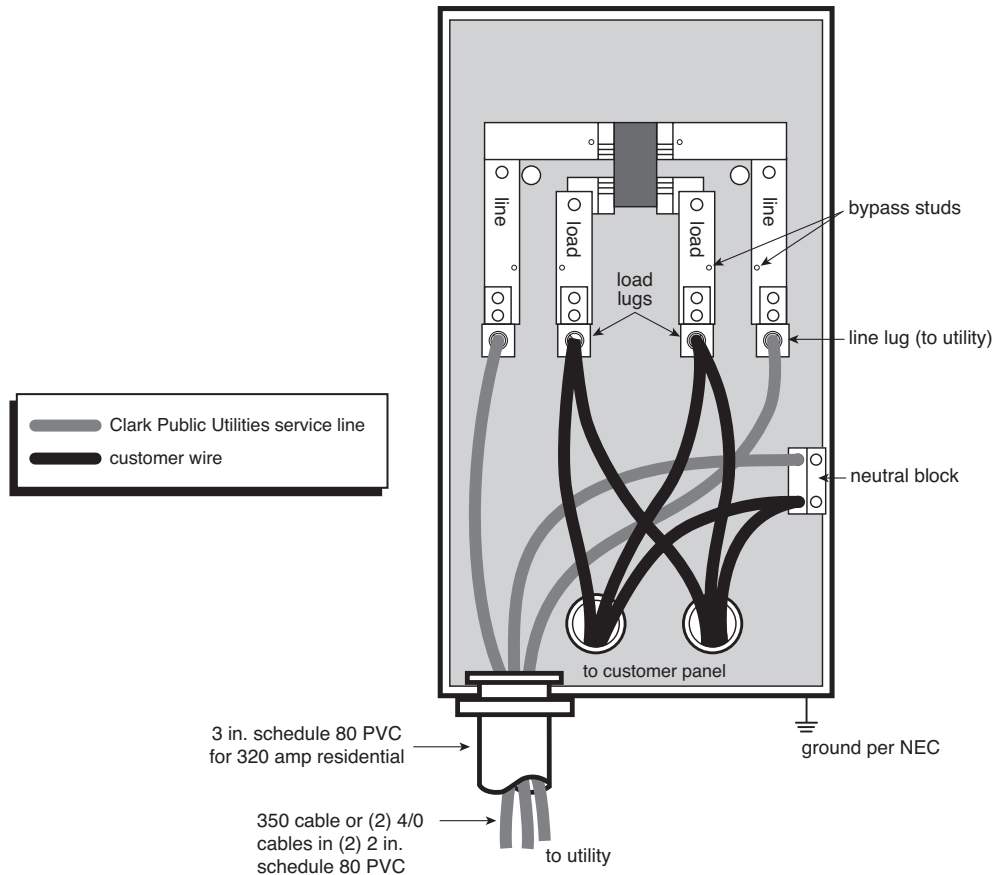
NOTE: If the structure requires more than 320 amps of continuous current, the customer is required to install a CT metered service.

In addition to the meter base requirements listed earlier in this chapter, Class 320 meter bases for 400 amp services require:

- ▶ Rating for 120/240 volts and 320 amps continuous current.
- ▶ Four meter jaws and one connection point for the neutral conductor.
- ▶ A Class 320 **manual block bypass** (*Figure 22*).

NOTE: Do not route service conductor through the center knockout located on the bottom of the meter base.

Figure 22 Typical underground class 320 amp residential meter base



Services over 400 amps

All 120/240 volt services over 400 amps (320 amps continuous current) require CT metering. CT metered services are available at an additional charge. This service requires a different meter base (**Figure 23**) and additional equipment (CT enclosure, conduit, PED connectors, CT mounting bracket, etc.). All CT metering equipment is installed on the outside of the structure. Clark Public Utilities provides and installs the CTs after the service has passed an electrical inspection.

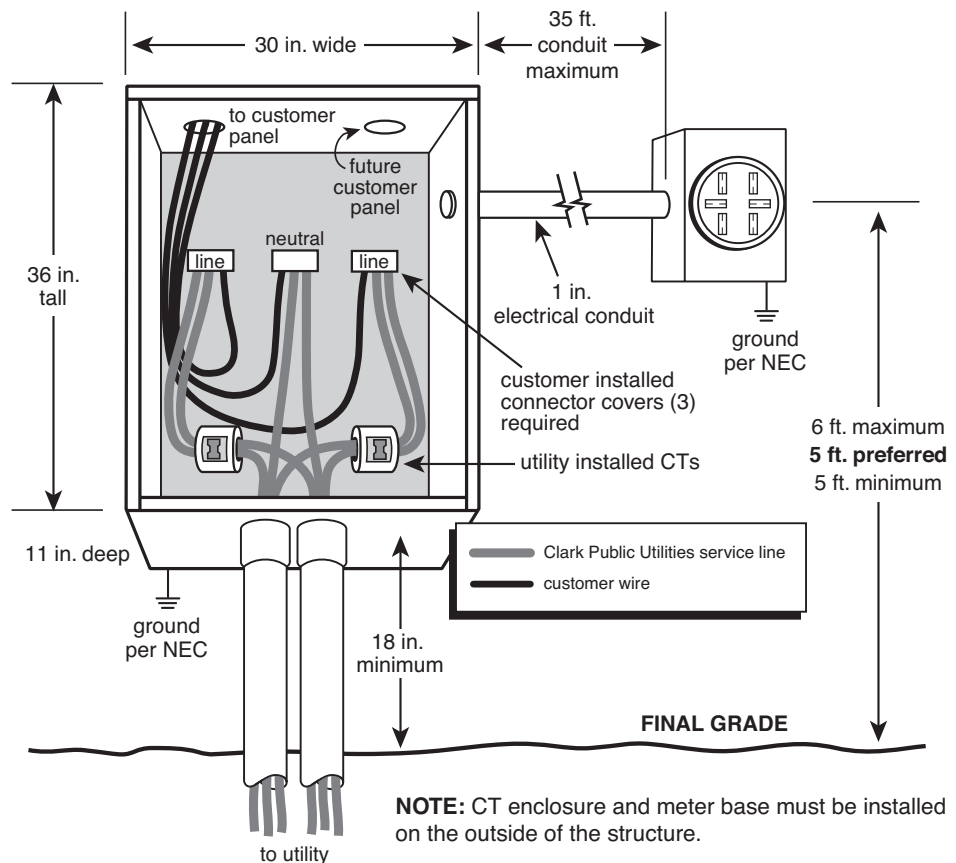
CT enclosure

The meter base and CT enclosure installed shall meet the following general requirements:

- ▶ Installed on the outside of the structure.
- ▶ For CT services with **feed through CTs**, the CT enclosure shall have minimum dimensions of 30" x 36" x 11".
- ▶ If bar mounted CTs are installed, the CT enclosure shall have minimum dimensions of 30" x 36" x 11" **and** a hinged door.

NOTE: A CT enclosure cannot be used as a junction box or bus gutter.

Figure 23 Current transformer (CT) metering for services over 400 amps



Conduit

The conduit between the meter base and CT enclosure is required to be:

- ▶ 1-inch electrical conduit.
- ▶ Schedule 80, PVC or rigid galvanized.
- ▶ A maximum length of 35 feet.
- ▶ Continuous, with no conduit bodies (LB joints, condulets, etc.).
- ▶ Installed with no more than three 90-degree elbows in the total length.

CT connectors

Feed through CTs require block-style connectors. These connectors are available in two sizes, 4-hole and 6-hole, depending on the number of conductors the service will require. The electrical contractor or customer is responsible for the installation and make up (including an insulating cover) of each connector prior to the electrical inspection.

CT mounting base

Clark Public Utilities currently accepts feed through CTs for residential electric services. ***Bus bar mounting*** CTs are preferred but optional. Call your utility representative for additional information and approval of installing bus bar mounted CTs.

Customer generation metering

Customers interested in generating a portion of their own electricity using renewable resources may be eligible to participate in Clark Public Utilities' Net Metering program.

A generation metering system is made up of two types of meters. A billing (net) meter and a production meter. In general, these two meters record the power provided by the utility to the customer and what the customer generates. The "net" is the difference between the two.

Customers interested in installing a generation metering system are responsible for the following:

- ▶ Reviewing the utility's ***Interconnection Standards and Production Metering Agreement***.
- ▶ Submitting an ***Application for Interconnection*** to Clark Public Utilities Energy Resources Department, PO Box 8900, Vancouver WA, 98668. A schematic drawing of the proposed generation system and a non-refundable application fee are required at submittal. Clark Public Utilities will review the design and, if necessary, provide an electrical design outlining any distribution system upgrades necessary to support the addition of the customer's generation system.
- ▶ Paying for all equipment and costs associated to distribution system upgrades.

- ▶ Upon receiving written design approval from Clark Public Utilities, securing an electrical wiring permit from the appropriate inspecting body (Washington State Department of Labor and Industries, or the City of Vancouver).
- ▶ Providing and installing all equipment as required by the utility-approved design, this handbook and the National Electric Code.
- ▶ Requesting all inspections of service and metering equipment from the appropriate inspecting body.
- ▶ After inspection approval, submitting a *Certificate of Completion* to the utility.

Once the *Certificate of Completion* has been approved, and the customer has completed backfilling the trench, Clark Public Utilities will connect the service and set the meter(s).

Visit our website www.clarkpublicutilities.com, or call (360) 992-3354 for additional information on customer generation metering systems.

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